DEPARTMENT OF ECOLOGY
State of Washington

State of Washington
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

PRIORITY DATE	WATER RIGHT NUMBER
June 3, 2009	S3-30594

MAILING ADDRESS
Seattle City Light
700 Fifth Avenue, Suite 3200
P.O. Box 34023
Seattle, WA 98124-4023

Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
4,400	CFS	(non-consumptive)

Purpose

PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Hydroelectric Power Generation	4,400		CFS			01/01 - 12/31

Total Diversions under S3-30594, and Certificates SWC 10181 and S3-27415 not to exceed 58,100 cfs

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Pend Oreille	Pend Oreille River	Columbia River	62

SOURCE FACILITY/DEVICE	PARCEL	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Boundary Dam	434010-460001	40N	43E	10	NE¼NE¼	48.99 degrees	-117.35 degrees

Datum: NAD83/WGS84

1170 feet South and 1200 feet West of the Northeast Corner of Section 10

Place of Use (See Attached Map)

PARCELS (NOT LISTED FOR SERVICE AREAS)
434010-460001

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE
Place of Use located in parcel 434010-460001 within Section 10, T. 40 N., R 43 E.W.M.

Proposed Works

The Boundary Dam Hydroelectric Project consists of an existing hydroelectric power plant with four 208,000-hp and two 268,000-hp Francis turbines, for a total rated capacity of 1,368,000-hp for all 6 generating units. Water is diverted upstream of the dam at the forebay, passed through the turbines, and released into the tailrace immediately downstream of the site. This appropriation will reconcile the Boundary project's water rights with its currently installed capacity, and will therefore allow generation at the currently installed rated capacity of 1,368,000-hp for all 6 generating units. No new generating facilities are being installed under this water right.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Started	Completed	In Use

Measurement of Water Use

How often must water use be measured?	Weekly
How often must water use data be reported to Ecology?	Annually (Mar 31)
What rate should be reported?	Weekly Peak Rate of Diversion in cfs measured on an hourly average basis

Provisions

MEASUREMENTS, MONITORING, METERING AND REPORTING

Water use data shall be recorded weekly and maintained by the Project operator for a minimum of five years. The maximum rate of diversion/withdrawal shall be submitted to the Department of Ecology by March 31st of each calendar year.

An approved measuring device shall be installed and maintained, or an approved alternative method of measuring shall be implemented for the Project's diversions from the Pend Oreille River authorized by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use," WAC 173-173. http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html

Recorded water use data shall be submitted via the Internet. To set up an Internet reporting account, contact the Eastern Region Office. If you do not have Internet access, you can still submit hard copies by contacting the Eastern Region Office for forms to submit your water use data.

Department of Fish and Wildlife Requirement(s)

This project shall be managed in accordance with fishway criteria (RCW 77.57) as directed by the Department of Fish and Wildlife and as approved by the Federal Energy Regulatory Commission.

Contact the Department of Fish and Wildlife, 600 Capitol Way N, Olympia, WA 98501-1091. Attention: Habitat Program, Phone: (360) 902-2534 if you have questions about fishway criteria. http://wdfw.wa.gov/about/regions/

Schedule and Inspections

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times to the project location, and to inspect at reasonable times records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Annual Power License Fee

No new generating facilities are being installed under this water right. Accordingly, there is no change in the project's theoretical horsepower, which is subject to an annual license fee to be paid in advance to the State of Washington, on or before the first day of January of each year. This authorization is subject to the fees in RCW 90.16.050 and 90.16.090.

Proof of Appropriation

The water right holder must file the notice of *Proof of Appropriation* of water (under which the certificate of water right is issued) when the quantity of water required by the project has been put to full beneficial use. The certificate will reflect the extent of the project perfected within the limitations of the water right. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

General

Total Diversions under S3-30594, and Certificates SWC 10181 and S3-27415C shall not exceed 58,100 cfs.

Findings of Facts

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I concur with the investigator that water is available from the source in question, that there will be no impairment of existing rights, that the purpose(s) of use are beneficial, and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. S3-30594 for a total of 4,400 cfs non-consumptive for the purpose of hydropower generation, subject to existing rights and the provisions specified above.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of the Order.

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

- You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW Ste 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Signed at Spokane, Washington, this day of 2012.

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Keith L. Stoffel
Section Manager
Water Resources Program -- Department of Ecology
Eastern Regional Office

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov. To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser.

BACKGROUND

On June 3, 2009, Seattle City Light (SCL) filed an Application for a Water Right Permit with the Department of Ecology (Ecology) to increase their diversion of the Pend Oreille River to reflect the installed hydraulic capacity of the Boundary Dam Hydroelectric Project (Project). The applicant requested an increase of 4,400 cfs (measured on an hourly average basis) for non-consumptive hydroelectric power generation. The application was accepted by Ecology for processing and assigned application number S3-30594.

Project Description

The Boundary Dam Hydroelectric Project, owned and operated by the City of Seattle, Seattle City Light Department (SCL), is the City's largest generating facility supplying 35 to 45 percent (depending on water conditions) of Seattle's power requirements. Total dependable plant capability is approximately 1,040 megawatts (MW) at the existing maximum water surface elevation (1,994 feet North American Vertical Datum [NAVD] 88 at the forebay).

The Project is located on the Pend Oreille River in northeastern Washington, and is one of eleven hydroelectric and storage projects in the Clark Fork - Pend Oreille River basin. The dam is located 1 mile south of the Canadian border, 16 miles west of the Idaho border, 107 miles north of Spokane, and 10 miles north of Metaline Falls, in Pend Oreille County. The dam is at river mile 17 on the Pend Oreille River, in the NE¼ of Section 10, Township 40 N., Range 43 E.W.M. The upstream end of Boundary Reservoir is located immediately downstream of the Box Canyon Dam, at river mile 34.5, in the NE¼ of Section 19 of Township 38 N., Range 43 E.W.M. The Project area lies within the Washington Department of Ecology's (Ecology) Watershed Resource Inventory Area (WRIA) 62 and U.S. Geological Survey (USGS) Hydrologic Unit (HUC) 17010216.

The Project was constructed in the mid 1960s and operates under an existing Federal Energy Regulatory Commission (FERC) license. The present license for the Project expired on September 30, 2011, and in accordance with FERC regulations, SCL filed an application for a new license by September 30, 2009. Under the new FERC license, SCL proposes to operate the Project as it is currently licensed, but with the formalization of two currently voluntary operational measures: forebay water surface elevation restrictions primarily for summer recreation enhancement, and turbine unit sequencing to reduce total dissolved gas (TDG) production.

This project is regulated by FERC, under the authority of the Federal Power Act (FPA). FERC may issue new licenses for a period of 30 to 50 years for the construction, operation, and maintenance of jurisdictional hydropower projects. FERC is considering the issuance of a new license to SCL for the existing Boundary Dam Project (FERC No. 2144). The purpose of the proposed FERC action is to allow the Project to continue to provide reliable, low-cost electrical energy for the benefit of residential, industrial, and governmental customers, and to serve the energy needs of the region.

Table 1 Summary of Application No. S3-30594

Attributes	Proposed
Applicant:	Seattle City Light
Date of Application:	June 3, 2009
Instantaneous Quantity:	4,400 cfs
Annual Quantity:	Non-consumptive
Source:	Pend Oreille River
Point of Diversion:	NE¼NE¼ of Section 10, Township 40 North, Range 43 E.W.M.
Purpose of Use:	Hydropower
Period of Use:	Continuous, Jan. 1 through Dec. 31 each year
Place of Use:	The Boundary Dam Project is a **non-consumptive** Power Supply Operation. The water will be immediately returned to the Pend Oreille River at the tailrace of the dam.

Legal Requirements for Application Processing

The following requirements must be met prior to processing a water right application:

- **Public Notice**
  A public notice for Application No. S3-30594 was published in the Newport Miner, Pend Oreille County, on Feb. 3 and 10, 2010. No protests were filed in response to this application.

- **State Environmental Policy Act (SEPA)**
  This project is not exempt from the SEPA process and SCL acting as lead agency issued an Environmental checklist in June of 2011. It was determined that this project does not have a probable significant adverse impact on the environment and a Determination of Non-Significance was issued for this project in July of 2011. No comments were received during the public SEPA Process.

- **Water Resources Statutes and Case Law**
  RCW Chapter 90.03 authorizes the appropriation of public water for beneficial use and describes the process for obtaining a water right. Laws governing the water right permitting process are contained in RCW 90.03.250 through 90.03.340.

  Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, this application has been processed by Pacific Groundwater Group (PGG) under Ecology's Cost-Reimbursement Work Assignment No. PGG009 (master contract No. C1000192).

- **Cost Reimbursement Processing**
  RCW 90.03.265(2) provides that in pursuing a cost-reimbursement project, the Department must determine the source of water proposed to be diverted or withdrawn from, including the boundaries of the area that delimit the source. The Department must determine if any other water right applications are pending from the same source. A water source may include surface water only, groundwater only, or surface and groundwater together if the Department finds they are hydraulically connected. The Department shall consider technical information submitted by the applicant in making its determinations under this subsection.

  However, RCW 90.03.265(1)(b) provides that the requirement for an applicant to pay for the processing of senior applicants does not apply in situations where it can be determined that the water allocated to one party will not diminish the water available to a senior applicant from the same source of supply. Since this requested appropriation is non-consumptive with all water passed through the turbines and returned to the river, the water use will be neutral to other users and thus, this application can be processed prior to other pending applications.

INVESTIGATION

Site Visit and Information Review

The Boundary Dam facility is located on the Pend Oreille River at River Mile (RM) 17. This is an existing facility that has been in operation since early 1967. The intent of this application is to reconcile the water right authorizations with installed capacity at the facility.

Information for this investigation was obtained during a site visit conducted on October 4, 2011 by Jill Van Hulle of Pacific Groundwater Group and Kimberly Pate, a representative of SCL. Additional information was obtained from:

- Applicable RCW and WAC chapters
- Ecology records
- Historical aerial photographs and maps
- Geographic Information System (GIS) data
- Support documentation including SEPA documents, information relating to FERC relicensing process, maps, and project descriptions

Project Description

General Background

The intent of this application is to obtain a new water right to divert up to 4,400 cfs (measured on an hourly average basis) for non-consumptive hydropower generation. The Boundary Hydroelectric Project is already constructed and operates under license No. 2144 from the Federal Energy Regulatory Commission (FERC). Since previously issued water rights were based on estimated capacity as opposed

to actual installed capacity, additional water rights are needed to (I) operate the existing Project at its full capacity; and (2) minimize the need to spill water over the dam during high flow events. This request for additional water rights does not involve any construction or change to the existing facility.

SCL's Boundary Hydroelectric Project was constructed in 1967. It is currently operated under two diversionary water rights (Qi only with non-consumptive designations) and one reservoir right (Qa only). The new water right would be additive to the Project's existing diversionary water rights (*SWC* 10181 *and S3-27415*), which were issued based on the initial anticipated (rated) capacity of the Project, rather than actual installed hydraulic capacity.

The Boundary Project consists of an existing hydroelectric power plant with four 208,000-hp and two 268,000-hp Francis turbines. Water upstream of the dam flows into the forebay through a trash-rack, passes through the penstocks into the turbines, and is released into the tailrace immediately downstream of the dam. The water right application is not associated with any construction or change to the existing facility or its theoretical generating capacity. It is merely to reconcile the water rights for the Project with its current capacity and configuration.

Pend Oreille River

With a total drainage area of 26,260 square miles (25,090 square miles in the United States and 1,170 square miles in Canada), the Pend Oreille River is one of the two main tributaries to the Columbia River, contributing approximately 10 percent of the Columbia River's flow on an annual basis (Muckleston 2003).

The Pend Oreille River is approximately 120 miles long from its head at the outlet of Lake Pend Oreille to its confluence with the Columbia River. On average, the river gains about 1,300 cubic feet per second (cfs) between Albeni Falls Dam and Boundary Dam, with about 18 percent of that inflow coming from Sullivan Creek, the major tributary to Boundary Reservoir. However, most of the Pend Oreille River's tributaries in Washington are small streams.

Significant storage reservoirs within the basin include Hungry Horse Reservoir and Flathead Lake in Montana, and Lake Pend Oreille and Priest Lake in Idaho. Other hydroelectric projects along the mainstem Pend Oreille River upstream of the Project include the Box Canyon Project, the Albeni Falls Project, the Cabinet Gorge and Noxon Rapids developments of the Clark Fork River Project in Idaho and Montana, and the Thompson Falls Project in Montana.

While upstream projects have a significant effect on inflows to the Boundary Project reservoir due to the basin size and corresponding annual flow, typically no single project has an overriding influence on flows in the river.

Downstream of Boundary Dam, the Pend Oreille River flows through the Seven Mile and Waneta dams, both in Canada, before entering the Columbia River. In addition, the Sullivan Creek Hydroelectric Project is located on Sullivan Creek, the main tributary to Boundary Reservoir. The Sullivan Creek Hydroelectric Project is owned by the Pend Oreille PUD.

Installed Infrastructure

Boundary Dam is situated in a narrow canyon and seated on interbedded limestone and dolomite of the Metaline Limestone formation. The structure is a variable-radius, concrete-arch dam with a total height

of 360 feet above the lowest part of the foundation and a structural height of 340 feet. The dam varies in thickness from 8 feet at its crest to 32 feet at its base. It has a crest length of 508 feet and a total length, including the spillways, of 740 feet. The dam impounds the Pend Oreille River to a normal high water surface elevation of 1,994 feet NAVD 88, (North American Vertical Datum) as measured in the forebay. The average elevation of the river surface below the dam is approximately 1,731 feet NAVD 88; the reservoir provides approximately 263 feet of gross head for power purposes.

Table 2 – Boundary Dam Specifics

Structural height of dam	340 feet
Length of crest, arch dam only	508 feet
Total length of dam, including spillways	740 feet
Dam thickness at base	32 feet
Dam thickness at crest	8 feet
Elevation at crest of dam (roadway)	2,004 feet NAVD 88
Deepest foundation elevation	1,644 feet NAVD 88
Concrete volume:	
Arch dam	120,000 cubic yards
Spillways	20,000 cubic yards

The Project has two spillways fitted with radial gates, one on each abutment. Each spillway is 50 feet wide and controlled by a radial gate 45 feet high. The two radial gate spillways have a combined total maximum discharge capacity of 108,000 cfs at forebay elevation 1,994 feet NAVD 88. Seven low-level sluices through the dam under a head of 190 feet (at forebay elevation 1,994 feet NAVD 88) provide an additional 252,000 cfs of the total 360,000 cfs discharge capacity of the dam.

At its normal maximum water surface elevation at the forebay (1,994 feet NAVD 88), the 17.5-mile-long Boundary Reservoir has a surface area of approximately 1,794 acres, a shoreline length of roughly 47 miles, and a maximum depth in the forebay of approximately 270 feet. The reservoir's gross storage capacity is approximately 87,913 acre-feet and its usable storage capacity is approximately 40,843 acre-feet.

Water Availability and Flow Data

Since Boundary Dam is an existing facility and the only change is how water is discharged downstream, no impacts to streamflow are predicted. The FERC license for the Project does not include minimum flow, or other limitations specific to the Boundary Dam. Because of the large amount of water flowing through the system and the limited amount of storage capacity in the reservoir, the residence time of the reservoir is very short. Table 3 provides a summary of annual peak inflow to Boundary Reservoir, as recorded at USGS gage 12396500 since the completion of the Project (1967) and documents the range river flows over the period of operation. Peak flows have been as high as 136,000 cfs to a low of 27,500 cfs.

Water Year	Inflow (cfs)	Water Year	Inflow (cfs)
1972	136,000	2003	80,500
1997	134,000	1986	79,200
1974	133,000	1995	77,100
1971	114,000	1969	76,100
1981	106,000	1984	73,100
1982	105,000	1978	67,600
1991	104,000	1968	65,500
1970	103,000	1989	63,600
1975	103,000	1985	62,300
1996	100,000	1988	58,000
2002	100,000	1993	56,800
2006	98,400	2007	55,400
1980	98,300	2000	54,000
2008	96,000	2004	51,300
1976	88,400	1987	44,300
1979	87,100	1994	33,600
2005	86,300	1991	32,400
1998	84,600	2001	32,100
1983	84,000	1976	29,000
1990	83,700	1973	27,500
1999	82,700		

Average annual flows in the Pend Oreille River for the 92-year period of record (1912-2004) were analyzed to determine historic trends in basin hydrology (SCL, 2008a). The long-term average flow during this period was 26,370 cfs. Annual runoff is produced primarily by melting snow upstream of the Project, with peak flows typically occurring from April through June. A detailed report containing hydrologic statistics that describe the period–calendar years 1987 through 2005–used to characterize existing operations can be found in SCL, 2008a.

Existing Water Rights

A water right must be obtained from the State of Washington to beneficially use surface water or groundwater for power or other purposes. SCL holds water rights associated with the Boundary Project as described in Table 4.

The intent of this application is to align the Project's maximum discharge volume with the Project's water rights. Until Ecology issues a permit, SCL manages the Project (i.e., by spilling excess river flow rather than using it for generation) to stay within the current water rights, which authorize a discharge volume of 53,700 cubic feet per second (cfs) for power generation. The water rights reflected in Table 4 are otherwise sufficient for operation and maintenance of the Project, including all activities related to power generation as well as operation and maintenance of the Forebay Recreation Area and Vista House as proposed in the License Application (SCL, 2009).

Table 4 – Boundary HED Water Rights

Water Right	Purpose of Use	Season of Use	Qi	Qa	Source
S3-27415C	Non-consumptive hydropower	Continuously	18,700 cfs		Pend Oreille River
S3-13196C SWC 10181	Electric light and power	Continuously	35,000 cfs		Pend Oreille River
S3-30594A	Non-consumptive hydropower	Continuously	4,400 cfs		Pend Oreille River
R3-15021C SWC 10182	Power	Continuously	Storage	94,500 AF	Pend Oreille River
S3-17825C SWC 10210	Domestic supply	Continuously	0.1 cfs	6.7 AF	Gardner Creek
	Fire protection	As needed	0.9 cfs		
S3-30103P	Non-consumptive powerhouse cooling	Continuously	1.5 cfs	1,088 AF	Gardner Creek
S3-30102P	Seasonal irrigation of 15 acres;	April 1 to Oct 1	0.73 cfs	27.5 AF	Pend Oreille River
	Fire protection	As needed	1.1 cfs		
G3-30099P	Multiple domestic	Continuously	100 gpm	2 AF	Well in S3 T40N R43EWM
G3-30098C*	Multiple domestic,	Continuously	155 gpm	5 AF	3 wells in S3 and S10, T40 N, R43EWM
	Power house cooling	Continuously		245 aF	

**The February 2009 certificate for this water right includes the following statement (p. 2): "Ground Water Certificate No. G3-30098P is issued as a back-up water supply to the surface water diversion from Gardner Creek under Surface Water Permit No. S3-30103P. The powerhouse cooling portion under this certificate is used as an alternate supply to Surface Water Permit No. S3-30103P."*

Impairment Considerations

Other Water Right Holders

Downstream water right holders will not be affected by increased diversion through the turbines because the diversion would be a non-consumptive use. The project does not permanently remove water from the river, and there are no other water rights or points of diversion for other water uses between the forebay and the tailrace.

Senior Water Right Applicants

There are twenty-two pending surface water applications in WRIA 62 that are senior to this application. While SCL's application is for non-consumptive purposes, the other pending applications were filed for consumptive purposes – primarily irrigation and domestic supply, and all other pending applications are for points of diversion located upstream of the Boundary project's point of diversion.

WR No.	Applicant	Date filed	Purpose	Qi	Qa	Acres	Location (T R S)	Q ¼ Q ¼	Source
S3-30482	Woelfel Barry	3/28/2005	IR	0.4	30	20	37.0N 43.0E 05	NE/NW	PEND OREILLE RIVER
S3-30494	Loftis Charles	7/18/2005	IR,FR	50		0.5	32.0N 44.0E 15	NW/NW	PEND OREILLE RIVER
S3-30479	Knuth Cherylon	9/27/2005	IR,DS	0.02		0.25	32.0N 45.0E 09	NW/NE	BEAD LAKE
S3-30502	Marthaller James	12/1/2005	IR,DM	0.22	79	3	32.0N 44.0E 35		PEND OREILLE RIVER
S3-30514	Nance Thomas	5/24/2006	IR,FR	0.13	5	2	32.0N 44.0E 09	SE/SE	PEND OREILLE RIVER
S3-30515	Massnick Jeff	7/3/2006	ST,DG	0.01			38.0N 43.0E 04	SW/NE	WOLF CREEK
S3-30525	Beem William	8/2/2006	DS	0.04			37.0N 43.0E 29	SW/SW	UNNAMED SPRING
S3-30517	Graham Elsie	8/2/2006	IR,DS	0.02		0.5	34.0N 43.0E 35	NE/SW	TACOMA CREEK
S3-30522	Archer Richard	8/25/2006	IR,DS	0.22	79	2.5	32.0N 44.0E 35		PEND OREILLE RIVER
S3-30521	Archer Richard	8/25/2006	IR,DS	0.22	79	2.5	32.0N 44.0E 35		PEND OREILLE RIVER
S3-30520	Smith Richard	9/13/2006	DS	0.02			37.0N 43.0E 17	SW/NW	PEND OREILLE RIVER
S3-30523	Romero Rick	9/25/2006	DG	0.02			32.0N 45.0E 30	NW/NE	PEND OREILLE RIVER
S3-30531	Kirby Ralph	4/10/2007	IR,DS	0.02		0.5	35.0N 44.0E 29		PEND OREILLE RIVER
S3-30533	Berg Yvonne	4/23/2007	IR,FR	0.02		1	32.0N 44.0E 16		PEND OREILLE RIVER
S3-30534	Neely Timothy	6/8/2007	IR,DS	0.02		0.25	32.0N 45.0E 04		BEAD LAKE
S3-30539	Christie Matthew	7/30/2007	ST,IR	0.01		2	38.0N 43.0E 04	SW/NE	WOLF CREEK
S3-30548	Solberg Steve	9/10/2007	IR,DS	0.02		0.75	36.0N 43.0E 03		PEND OREILLE RIVER
S3-30553	Simonson Mark	3/13/2008	RE,FS	0.06	6.5		33.0N 44.0E 34	NE/SW	UNNAMED SPRING
S3-30557	Romans Jeff	6/3/2008	RE,DS	0.01			37.0N 43.0E 33		PEND OREILLE RIVER
S3-30558	Renz William	6/8/2008	RE,DS	0.01			37.0N 43.0E 33		PEND OREILLE RIVER
S3-30565	Holman John	8/27/2008	DS	0.04			36.0N 43.0E 26	SW/NW	PEND OREILLE RIVER
R3-30578	Woltering William	2/27/2009	WL,FS		10		31.0N 44.0E 04		UNNAMED SPRING
S3-30594	*Seattle City Light*	*6/3/2009*	*PO*	*4400*			*40.0N 43.0E 10*	*NE/NE*	*PEND OREILLE RIVER*

RCW 90.03.265 provides that in cost-reimbursement situations, applications that are non-consumptive and will not diminish the amount of water available to other applicants may be processed ahead of older applications. See http://apps.leg.wa.gov/RCW/default.aspx?cite=90.03.265#.

Instream Flows

As of the time of processing this report, no instream flow regulation has been formally established by Washington Administrative Code for the Pend Oreille River. However, maintaining a healthy, functioning river system is an important goal for all parties involved in the project.

Watershed Planning and Instream Flow Status

Watershed Planning under RCW 90.82 is being conducted in the Pend Oreille watershed and the planning group has produced a Phase 4 Detailed Implementation Plan. Establishing formal instream flows is identified as a future goal of the group, with the understanding that once Ecology undertakes rule-making, the planning group will have input to the process.

Water Quality Considerations

Total Dissolved Gas (TDG)

TDG can be a concern at hydroelectric projects due to the effects of water pouring over spillways of dams and plunging into the river below the dam, thereby creating air bubbles. When these bubbles are

carried to depth below the dam, the higher hydrostatic pressure forces air from the bubbles into solution. The result is water supersaturated with dissolved nitrogen, oxygen, and the other constituents of air. As the bubbles rise in the aerated zone of the tailrace, some of the gas leaves solution. However, as the bubbles dissipate and the water enters the downstream reach, the remaining TDG will remain unless wind or channel induced turbulence causes more degassing.

The Pend Oreille River is listed on Ecology's 303(d) list as being impaired for TDG. Ecology has prepared a TDG Total Maximum Daily Load (TMDL) for the river (Ecology, 2007). As part of the FERC relicensing process, and as required by WAC 173-201A-510(5)(c), SCL is addressing the TDG load allocations identified in the TMDL as part of the 401 certification of the Project in their Total Dissolved Gas Attainment Plan (TDGAP). This water right application will actually serve to reduce TDG production since water leaving the facility via the turbines has lower concentrations of TDG than the water spilled over the dam.

Temperature

As part of the relicensing of the Boundary Hydroelectric Project by the Federal Energy Regulatory Commission No. 2144, SCL must obtain Clean Water Act (CWA), Section 401 water quality certification from Ecology.

The Pend Oreille River is listed on Ecology's 303(d) list as being impaired for temperature. Ecology has prepared a Temperature Total Maximum Daily Load (TMDL) for the river (Ecology, 2011). As required by WAC 173-201A-510(5)(c), SCL addressed the temperature load allocations identified in the TMDL as part of the 401 certification of the Project in their Temperature Attainment Plan (TAP).

To meet commitments under the Boundary Relicensing Settlement Agreement, SCL has prepared a TAP that summarizes the activities completed to date and outlines actions that will be implemented during the first ten years of the new license term that will contribute to temperature improvement goals in the Pend Oreille watershed by addressing temperature effects of the Project in the Boundary Reservoir.

This application as requested will not result in changes to temperature within the reservoir.

Other Considerations

Upstream Fish Passage

Boundary Dam was built without fish passage facilities because downstream power and water storage projects, such as Grand Coulee and Chief Joseph dams, blocked anadromous fish migrations to the Upper Columbia Basin. However, declines in populations of native salmonids, including bull trout, westslope cutthroat trout, and mountain whitefish have increased focus on migrating resident fish.

As a condition of the new FERC license, SCL will install, operate, maintain and monitor a single upstream trap-and-haul fishway facility (upstream fishway, or fishway) in the Boundary Project tailrace. Installation will occur within 14 years of license issuance. The purpose of this fishway is to provide safe, timely, and effective passage for bull trout, cutthroat trout, and mountain whitefish (target fish species) in the Project area for the license term and any subsequent annual licenses. The fishway will include a fixed entrance(s) and a release location(s) at least one mile upstream of the Boundary Dam. WDFW approved of this plan to address upstream fish passage, which was included in the comprehensive

relicensing Settlement Agreement, to which both WDFW and Ecology are parties. WDFW recommended that these actions be required in the new FERC license, and FERC's Final EIS indicates that the new license will include this requirement.

Entrainment mortality reduction

The Boundary dam was built without entrainment reduction facilities. As a condition of the new FERC license, SCL will develop and implement studies sufficient to quantify the effects of entrainment on target species (bull trout, westslope cutthroat trout and mountain whitefish) and to determine whether any population of target fish species (i.e., a unique population that constitutes a substantial percentage of fish in the Project area or that has a unique evolutionary niche that requires special protection) or a substantial number of target fish are affected by Project entrainment. Based on the results of these studies, SCL will either build facilities at the Project to improve Boundary Dam survival of target species or implement appropriate non-operational measures to improve survival of target species. WDFW approved of this plan to address project related entrainment mortality, which was included in the comprehensive relicensing Settlement Agreement, to which both WDFW and Ecology are parties. WDFW recommended that these actions be required in the new FERC license, and FERC's Final EIS indicates that the new license will include this requirement.

CONCLUSIONS

Under the provisions of RCW 90.03.290, a water right shall be issued upon findings that water is available for appropriation for a beneficial use and that the appropriation thereof, as proposed in the application, will not impair existing rights or be detrimental to the public welfare. After consideration of the facts presented in this report, I make the following conclusions:

Availability

The physical availability of water for this project is based on natural flows in the river and availability of instream flows as released from upriver facilities. As previously stated, peak flows into the reservoir have been as high as 136,000 cfs, thus there are periods during the year when water will be physically available for appropriation of the requested additional 4,400 cfs of non-consumptive water supply. Water is legally available since it is nonconsumptive and there are no other legal constraints to issuance of this permit.

Impairment

Authorization of this appropriation will not result in impairment to other water users because all water flowing in the Pend Oreille River is available immediately downstream without diminishment to downstream water users and because there are no diversions downstream of the Project. Instream resources will likewise not be impaired by this project since there are no impacts associated with running more water through the turbines rather than the spillway.

Public Interest

Hydroelectric power generation is a renewable resource, which reduces the pollutants that would otherwise be emitted if replaced by fossil fuels like coal, oil, or natural gas. Hydro power also helps

avoid some of the environmental impacts related to burning fossil fuels such as acid rain, generation of greenhouse gases, and depletion of the ozone layer.

This facility generates power to meet local and regional electricity demands with consideration given to natural resource protection and recreation.

Beneficial Use

Hydropower is considered to be a beneficial use of water.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that Water Right Application No. S3-30594 be approved, in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial.

- 4,400 cfs (total diversion rate 58,100 cfs when combined with previously issued water rights)
- Non-consumptive, hydro power production
- Year-round

Point of Diversion

The NE¼NE¼ of Section 10, Township 40 North, Range 43 E.W.M.

Place of Use

As described on Page 1 of this Report of Examination.

Jill E Van Hulle

Report prepared by: Jill Van Hulle, Pacific Groundwater Group

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Report reviewed by: Dan Tolleson, Water Resources Program

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Selected References

Muckleston, K. W. 2003. International Management in the Columbia River System. Oregon State University. UNESCO/IHP/WWAP, IHP-VI Technical Documents in Hydrology, PCCP series, No. 12.

SCL. 2009. Updated Study Report. Boundary Hydroelectric Project (FERC No. 2144). Seattle, Washington. Available: http://www.seattle.gov/light/news/issues/bndryRelic/br_document.asp. March 2009.

SCL. 2008a. Compilation of Project hydrologic data: preparation of hydrologic database and hydrologic statistics in support of relicensing studies, Boundary Hydroelectric Project (FERC No. 2144). Prepared by R2 Resource Consultants, Inc, Redmond, Washington. March 2008.

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